II. AMENDMENTS TO THE CLAIMS:

This listing of claims replaces all prior versions, and listings, of claims of the application.

1 – 10. (Cancelled)

11.   (Currently Amended) A method of evaluating image quality of an electron beam lithography tool, the method comprising the steps of:

generating a test array of test pattern cell exposures at at least thirteen a plurality of sub-field test positions in an exposure field, wherein each test pattern cell exposure within a given test array occurs under a different set of lithography tool test corrections; and

evaluating image quality based on the test arrays; and

applying a tool correction for a selected sub-field position within the exposure field based on recorded test corrections for the sub-field test positions, including:

implementing a two-dimensional, third-order polynomial equation for each recorded test correction;

calculating a set of correction coefficients for each two-dimensional, third-order polynomial equation; and

applying the set of correction coefficients to determine the tool correction for the selected sub-field position.

12.   (Original)   The method of claim 11, wherein each test pattern cell exposure has a corresponding exposure in each test array that occurs under the same set of lithography tool test corrections.

13.   (Original)   The method of claim 11, wherein the generating step includes:

repeatedly exposing the test pattern cell at each sub-field test position on a resist coated

substrate,

shifting the resist coated substrate a predetermined distance between each exposure to

generate the test array at each sub-field test position, and

developing the resist coated substrate to generate the test array at each sub-field test

position.

14.   (Currently Amended) The method of claim [[11]] 13, wherein the step of shifting

includes shifting in both a first direction and a second direction within a single plane.

15.   (Original)   The method of claim 11, wherein the evaluating step includes:

determining which exposure within each test array provides a highest image quality and

recording a test correction for that exposure for each sub-field test position.

16-17. (Cancelled)

18.   (Original)   The method of claim 11, wherein the evaluating step is conducted for at

least one of a focus correction, an in-axis astigmatism correction, and an off-axis astigmatism

correction.

19.   (Original)   The method of claim 11, wherein the test pattern cell includes:

a set of at least three elongated spaces, each elongated space having a different width than other elongated spaces in the set; and

at least one box-in-box pattern.

20-21. (Cancelled)

22.   (Currently Amended) A computer-readable storage medium having stored therein instructions for performing a method, the method comprising the steps of:

determining a lithography tool correction for a selected sub-field position within an exposure field of the lithography tool based on recorded test corrections for at least thirteen a plurality of sub-field test positions including:

implementing a two-dimensional, third-order polynomial equation for each recorded test correction;

calculating a set of correction coefficients for each two-dimensional, third-order polynomial equation; and

applying the set of correction coefficients to determine the lithography tool correction for the selected sub-field position.

10/604,051   Page 4 of 8

23.   (Currently Amended) A system for optimizing lithography tool image quality, the system comprising:

means for determining a tool correction for a selected sub-field position within an exposure field of a lithography tool based on recorded test corrections for at-least thirteen a plurality of sub-field test positions, the determining means including:

means for implementing a two-dimensional, third-order polynomial equation for each recorded test correction;

means for calculating a set of correction coefficients for each two-dimensional, third-order polynomial equation; and

means for applying the set of correction coefficients to determine the tool correction for the selected sub-field position.

24.   (New) The method of claim 11, wherein the plurality of sub-field test positions includes at-least thirteen sub-field test positions.

25.   (New) The storage medium of claim 22, wherein the plurality of sub-field test positions includes at least thirteen sub-field test positions.

26.   (New) The system of claim 23, wherein the plurality of sub-field test positions includes at least thirteen sub-field test positions.

10/604,051   Page 5 of 8

27.   (New) The system of claim 23, wherein the determining means further includes:

means for determining which exposure within each test array provides a highest image

quality and recording a test correction for that exposure for each sub-field test position.

28.   (New) The system of claim 23, wherein the test pattern cell includes:

a set of at least three elongated spaces, each elongated space having a different width than

other elongated spaces in the set; and

at least one box-in-box pattern.

10/604,051   Page 6 of 8

PAGE 7/9 * RCVD AT 3/28/2005 1:22:53 PM [Eastern Standard Time] * SVR:USPTO-EFXRF-1/5 * DNIS:8729306 * CSID:518 449 0047 * DURATION (mm-ss):01-56